

What is claimed is:

1. An Internet base station system comprising:
  - a first communication unit which transmits data to and receives data from an Internet mobile station;
  - a second communication unit which transmits data to and receives data from an Internet mobile switching center system and an Internet home location register system;
  - a storage unit which stores its own Internet Protocol address and at least one or more rental Internet Protocol addresses which are allocatable to the Internet mobile station;
  - a channel allocation unit which allocates a communication channel to a sending Internet mobile station when the sending Internet mobile station transmits a call requesting message to the Internet mobile switching center system via the first communication unit or when the Internet mobile switching center system transmits the call requesting message to a receiving Internet mobile station;
  - an address allocation unit which allocates a rental Internet Protocol address to the sending Internet mobile station, transmits address allocation information comprising identification information and the rental Internet Protocol address of the Internet mobile station, and the Internet Protocol address of the storage unit to the Internet mobile switching center system, withdraws the rental Internet Protocol address from the sending Internet mobile station when mobile communication between the sending Internet mobile station and the receiving Internet mobile station ends, and informs the Internet mobile switching center system of the withdrawal of the rental IP address; and
  - a call controller which receives an Internet Protocol address of the receiving Internet mobile station from the Internet mobile switching center system, transmits the Internet Protocol address of the receiving Internet mobile station to the sending Internet mobile station, and relays speech Internet Protocol packets between the sending Internet mobile station and the receiving Internet mobile station via the communication channel of the sending Internet mobile station.
2. The Internet base station system of claim 1, wherein the call controller performs a handoff process for the Internet mobile station and instructs the channel allocation unit and the address allocation unit to withdraw the communication channel and the rental Internet Protocol address from the Internet mobile station to disconnect a call when an adjacent Internet base station server takes over a function of managing the Internet mobile station; the channel allocation unit withdraws the communication

channel from the Internet mobile station during the handoff for the Internet mobile station; and the address allocation unit withdraws the rental Internet Protocol address from the Internet mobile station during the handoff for the Internet mobile station and informs the Internet mobile switching center system of the withdrawal of the rental Internet Protocol address from the Internet mobile station.

3. The Internet base station system of claim 2, wherein when the call controller receives a request for the handoff from the Internet mobile station, the call controller instructs the channel allocation unit and the address allocation unit, respectively, to withdraw the communication channel and the rental Internet Protocol address

10 4. The Internet base station system of claim 2, wherein the call controller requests the Internet mobile switching center system for the handoff when an intensity 15 of a signal received from the Internet mobile station is lower than a predetermined reference intensity, and the call controller instructs the channel allocation unit and the address allocation unit, respectively, to withdraw the communication channel and the rental Internet Protocol address when the Internet mobile switching center system 20 selects one among a plurality of adjacent Internet mobile station systems to manage the Internet mobile station so as to complete the handoff.

25 5. The Internet base station system of claim 1, wherein the call requesting message comprises identification information of the sending Internet mobile station and identification information of the receiving Internet mobile station.

30 6. The Internet base station system of claim 1 or 5, wherein the identification information of the Internet mobile station comprises at least one of a phone number allocated to the Internet mobile station and an electronic serial number allocated to the Internet mobile station.

35 7. The Internet base station system of claim 1, wherein the address allocation unit allocates the rental Internet Protocol address to the Internet mobile station, and stores the rental Internet Protocol address and the identification information of the Internet mobile station in the storage to link the rental Internet Protocol address with the identification information.

8. The Internet base station system of claim 1, wherein when the call controller receives the call requesting message from the sending Internet mobile station, the call controller requests the Internet mobile switching center system to allocate the communication channel and the rental Internet Protocol address to the receiving Internet mobile station based on the identification information of the receiving Internet mobile station, and transmits the rental Internet Protocol address of the receiving Internet mobile station to the sending Internet mobile station.

9. An Internet mobile switching center system comprising:

a first communication unit which transmits data related to registration of and a request for Internet Protocol address information to and receives the data from an Internet base station system;

a second communication unit which transmits data related to the request for the Internet Protocol address information to and receives the data from an Internet home location register system which is connected thereto;

a storage unit which stores address rental information comprising identification information of the Internet mobile station, an Internet Protocol address of the Internet base station system, and/or an IP address allocated to the Internet mobile station by the Internet base station system;

an address manager which stores first address rental information comprising the identification information of the Internet mobile station, which goes into a coverage area of the Internet base station system, and the IP address of the Internet base station system in the storage unit, deletes the first address rental information from the storage unit when receiving a request for deletion of the first address rental information from the Internet base station system, stores second address rental information comprising the identification information of the Internet mobile station, the IP address of the Internet base station system, and a rental Internet Protocol address of the Internet mobile station in the storage unit, and deletes the second address rental information from the storage unit when receiving a request for withdrawal of the rental IP address of the Internet mobile station from the Internet base station system; and

a call controller which searches for the storage unit based on identification information of a receiving Internet mobile station received from a sending Internet base station system, transmits a busy tone to the sending Internet mobile station when the storage unit stores an Internet Protocol address and a rental Internet Protocol address of a receiving Internet base station system corresponding to the identification information of the receiving Internet mobile station, instructs the receiving Internet base

station system to allocate a communication channel and a rental Internet Protocol address to the receiving Internet mobile station when the storage unit stores only the Internet Protocol address of the receiving Internet base station system corresponding to the identification information of the receiving Internet mobile station, transmits the rental

5 Internet Protocol address of the receiving Internet mobile station received from the receiving Internet base station system to the sending Internet base station system, and transmits the rental Internet Protocol address of the sending Internet mobile station to the receiving Internet base station system.

10 10. The Internet mobile switching center system of claim 9, wherein:

when the Internet base station system informs the address manager of the withdrawal of the rental Internet Protocol address through a handoff process for a first Internet mobile station, the address manager deletes Internet Protocol address rental information corresponding to the first Internet mobile station, and stores the Internet

15 Protocol address rental information of the first Internet mobile station received from an adjacent Internet base station system which takes over a function of managing the first Internet mobile station; and

20 the call controller which transmits a changed rental Internet Protocol address of the first Internet mobile station to a second Internet mobile station which is a corresponding Internet mobile station of the first Internet mobile station.

11. The Internet mobile switching center system of claim 9, wherein when the identification information of the receiving mobile station belongs to identification information of an Internet mobile station within a public switched telephone network or a

25 wireless Internet network, the call controller transmits the rental Internet Protocol address of the sending Internet mobile station to a gateway system which is connected to the public switched telephone network or the wireless Internet network and transmits an Internet Protocol address of the gateway system to the sending Internet mobile station.

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12. The Internet mobile switching center system of claim 9, wherein when the storage unit does not store the identification information of the receiving Internet mobile station, the call controller transmits the identification information of the receiving Internet mobile station to an Internet home location register system to identify an Internet mobile switching center system which manages an Internet base station system managing the receiving Internet mobile station, receives the rental Internet

Protocol address of the receiving Internet mobile station from the identified Internet mobile switching center system, transmits the rental Internet Protocol address of the receiving Internet mobile station to the sending Internet base station system, and transmits the rental Internet Protocol address of the sending Internet mobile station to the receiving Internet base station system.

5 13. A method of providing a wireless Internet mobile communication service, comprising:

10 (a) when a call requesting message is received from a first Internet mobile station or the call requesting message is transmitted from an Internet mobile switching center system to the first Internet mobile station, allocating a communication channel to the first Internet mobile station;

15 (b) allocating a rental Internet Protocol address to the first Internet mobile station and transmitting address allocation information comprising identification information and the rental Internet Protocol address of the first Internet mobile station, and an Internet Protocol address and identification information of a second Internet mobile station which is a corresponding Internet mobile station of the first Internet mobile station to the Internet mobile switching center system;

20 (c) transmitting the Internet Protocol address of the second mobile station from the Internet mobile switching center system to the first Internet mobile station;

(d) relaying speech Internet Protocol packets between the first Internet mobile station and the second Internet mobile station via a communication channel allocated to the first Internet mobile station; and

25 (e) when speech communication between the first Internet mobile station and the second Internet mobile station ends or a handoff for the first Internet mobile station and/or the second Internet mobile station is performed, withdrawing the rental Internet Protocol address from the first Internet mobile station and/or the second Internet mobile station and informing the Internet mobile switching center system of the withdrawal of the rental IP address from the first Internet mobile station and/or the second Internet 30 mobile station.

14. The method of claim 13, wherein step (e) comprises:

(e1) measuring an intensity of a signal received from the Internet mobile station;

35 (e2) when the measured intensity is lower than a predetermined reference intensity, requesting the Internet mobile switching center system for the handoff

5 (e3) when receiving an instruction to perform the handoff by selecting one of a plurality of adjacent Internet base station systems using the Internet mobile switching center system to manage the Internet mobile station, withdrawing the communication channel and the rental Internet Protocol address from the Internet mobile station; and  
5 (e4) informing the Internet mobile switching center system of the withdrawal of the rental IP address from the Internet mobile station.

10 15. The method of claim 13, wherein the identification information of the Internet mobile station comprises at least one of a phone number and an electric serial number of the Internet mobile station

15 16. The method of claim 13, prior to step (a), further comprising transmitting the identification information of the Internet mobile station to an Internet home location register system to register the Internet mobile station.

17. A method of providing a wireless Internet mobile communication service, comprising:

20 (a) storing first address allocation information which includes identification information of an Internet mobile station received from an Internet base station system and an Internet Protocol address of the Internet base station system and/or second address allocation information which includes identification information of the Internet mobile station, an Internet Protocol address of the Internet base station system, and a rental Internet Protocol address of the Internet mobile station in an address rental database;

25 (b) searching the address rental database based on identification information of a receiving Internet mobile station received from a sending Internet base station system, transmitting a busy tone to the sending Internet base station system when the address rental database retains an Internet Protocol address and a rental Internet Protocol address of a receiving Internet base station system corresponding to the identification information of the receiving Internet mobile station, instructing the receiving Internet base station system to allocate a communication channel and a rental Internet Protocol address to the receiving Internet mobile station when the address rental database retains only the Internet P address of the receiving Internet base station system corresponding to the identification information of the receiving Internet mobile station, transmits the rental Internet Protocol address of the receiving Internet mobile station from the receiving Internet base station system to the sending Internet base station

system, and transmits the rental Internet Protocol address of the sending Internet mobile station to the receiving Internet base station system; and

5 (c) when the Internet base station system requests withdrawal of the rental Internet Protocol address of the Internet mobile station, deleting the address allocation information corresponding to the Internet mobile station from the address rental database.

18. The method of claim 17, wherein step (c) comprises:

10 (c1) when receiving the withdrawal request of the rental Internet Protocol address of the first Internet mobile station through the handoff for the first Internet mobile station from the Internet base station system, deleting the address allocation information corresponding to the first Internet mobile station from the address rental database;

15 (c2) receiving the address allocation information corresponding to the first Internet mobile station from an adjacent Internet base station system which takes over a function of managing the first Internet mobile station and storing the address allocation information in the address rental database;

20 (c3) transmitting a changed rental Internet Protocol address of the first Internet mobile station to a second Internet mobile station which is a corresponding Internet mobile station of the first Internet mobile station; and

25 (c4) when receiving the withdrawal request of the rental Internet Protocol address of the first Internet mobile station due to ending of communication from the Internet base station system, deleting the address allocation information corresponding to the first Internet mobile station from the address rental database.

19. The method of claim 17, wherein in step (b), when the identification information of the receiving Internet mobile station belongs to the identification information of an Internet mobile station within a public switched telephone network or a wireless telephone network, the rental Internet Protocol address of the sending Internet mobile station is transmitted to a gateway system which is connected to the public switched telephone network or the wireless telephone network, and an Internet Protocol address of the gateway system is transmitted to the sending Internet mobile station.

30 35 20. The method of claim 17, wherein in step (b), when it is determined that the identification information of the receiving Internet mobile station is identification information of an Internet mobile station belonging to a wireless Internet mobile

communication network operated by another wireless Internet mobile communication service provider, the identification information of the receiving Internet mobile station is transmitted to an Internet home location register system within the wireless Internet mobile communication network operated by the another wireless Internet mobile communication service provider to identify an Internet mobile switching center system which manages an Internet base station system managing the receiving Internet mobile station, the rental Internet Protocol address of the receiving Internet mobile station is transmitted from the identified Internet mobile switching center system to the sending Internet base station system, and the rental Internet Protocol address of the sending Internet mobile station is transmitted to the receiving Internet base station system.

21. A computer-readable recording medium on which a program is recorded to execute the method of claim 13 or 17 in a computer.

15 22. An Internet mobile communication terminal comprising:  
a speech processor which converts an input speech signal into an electric signal or the electric signal into the speech signal;  
a keypad which receives a command from a user;  
a communication controller which transmits a call requesting message to an  
20 Internet base station system that is connected to a wireless Internet network, using a predetermined protocol, is assigned a communication channel and an Internet Protocol address from the Internet base station system to establish a communication path, and transmits its identification information to the Internet base station system in response to a paging signal that is broadcast by the Internet base station system; and  
25 a packet processor which generates Internet protocol packets from digital speech and video data and command data input from a keyboard based on the rental Internet Protocol address allocated by the Internet base station system, and restores the Internet protocol packets to digital speech and video data and character data.